



## PATENT ABSTRACTS OF JAPAN

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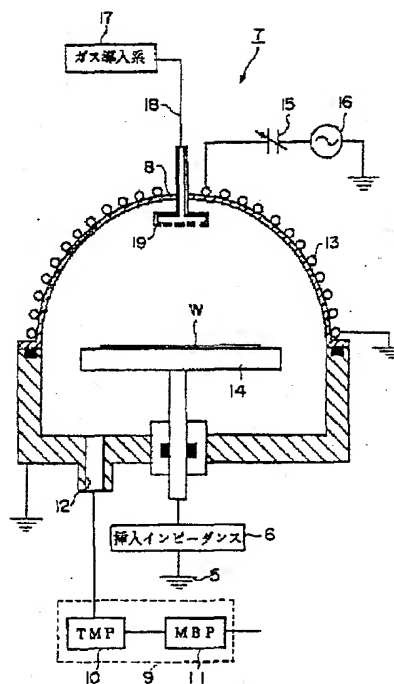
(54) **PLASMA PROCESSOR**

## (57) Abstract:

**PURPOSE:** To provide a plasma processor capable of suppressing the electrification of a semiconductor substrate by plasma to the utmost maintaining merit he high-speed processing.

**CONSTITUTION:** A plasma processor is provided with a semicircular reaction chamber 8, a substrate holder 14 provided in the lower part of the inside of the reaction chamber 8 for holding a semiconductor substrate W. a herical antenna 13 provided like a winding along the periphery of the reaction chamber 8 for generating plasma and its active species in the reaction chamber 8, a high-frequency power source 16 for supplying highfrequency power to the luelical antenna coil 13, an insertion-impedance 6 connected between the substrate holder 14 and the ground 5.

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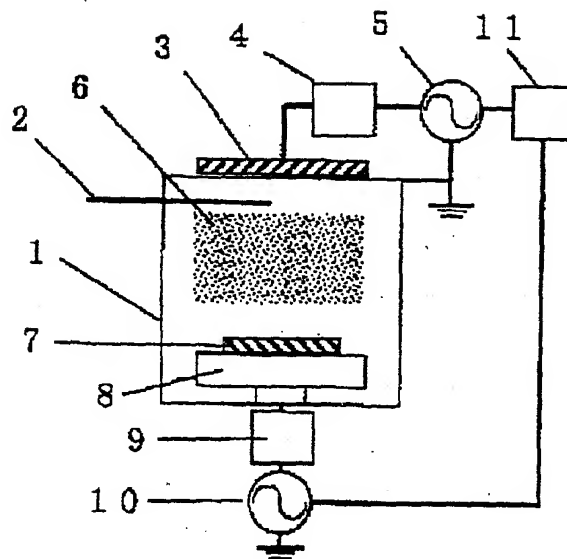
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TITLE : PLASMA-PROCESSING METHOD



ABSTRACT : PROBLEM TO BE SOLVED: To realize a highly accurate plasma processing, wherein a dissociation reaction in a plasma is suppressed.

SOLUTION: Provided in a plasma-generating chamber 1 a high-density plasma source, e.g. an inductively coupled type plasma source using a multiple spiral coil 3, a power supply 5 is modulated in an on/off manner by a pulse generator 11 for feeding a high-frequency power to the plasma source. Its modulation period is provided within the range of 20-200  $\mu$ s and its ON time/ modulation period within the range of 0.3-0.7, or controlling its modulation period within the range of 20-200  $\mu$ s and varying in time its ON time/modulation period, an etching processing method can be performed at a high speed and with high accuracy.

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156-643

INCREASING THE ETCH RATE RATIO OF  $\text{SiO}_2/\text{Si}$  IN FLUOROCARBON PLASMA ETCHING

J. W. Coburn

The etch rate ratio of  $\text{SiO}_2/\text{Si}$  in a fluorocarbon plasma is increased by the use of a solid surface in the discharge region. The solid surface is formed of any material which serves as a scavenger of F atoms. Examples of suitable materials are C, Si, Ti, W and Mo. The use of solid surfaces made of these materials lowers the etch rate of Si more than the etch rate of  $\text{SiO}_2$ , thereby increasing the  $\text{SiO}_2/\text{Si}$  etch rate ratio.